



MATHER AFB CALIFORNIA

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 467719



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

Barbara A. Lee, Director
8800 Cal Center Drive
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Edmund G. Brown Jr.
Governor

October 1, 2015

Mr. Douglas L. Self
Air Force Civil Engineering Center (AFCEC/CIBW)
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FINAL FOURTH FIVE-YEAR REVIEW REPORT, FORMER MATHER AIR FORCE BASE, CALIFORNIA

Dear Mr. Self:

The California Department of Fish and Wildlife, Office of Spill Prevention and Response (CDFW-OSPR) has reviewed the Final Fourth Five-Year Review Report (FYRR), received electronically on September 1, 2015. The five-year review report evaluates the performances of the remedial actions conducted during the fourth five-year review period to determine whether the remedial actions are protective of human health and the environment. The Final FYRR was prepared by URS Group, Inc. for the Air Force Civil Engineer Center (AFCEC/CIBW).

Enclosed are CDFW-OSPR's comments on the final FYRR report. The attached comments from Mr. Allen Tsao and Ms. Tami Nakahara (CDFW-OSPR) should be responded to or resolved. The Department of Toxic Substances Control staff concurs with CDFW-OSPR recommendation of a 3rd year of small mammal monitoring and the development of a waterfowl monitoring plan.

If you have any questions, please contact me by email at franklin.mark@dtsc.ca.gov, or at (916) 255-3584.

Sincerely,

Franklin Mark

Franklin Mark, PE
Hazardous Substance Engineer
Cleanup Program – Sacramento Office

Enclosure

cc: See next page.

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State of California
Department of Fish and Wildlife

Memorandum

Date: September 28, 2015

To: Franklin Mark, Project Manager
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From: Tami Nakahara, Senior Environmental Scientist (Specialist)
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C.L. Tsao for Tami Nakahara

Subject: **Combined Comments for (1) Final Fourth Five-Year Review Report, (2) Response to the Air Force's Second Response to Comments on the Draft Fourth Five-Year Review Report, and (3) Response to Draft Final Fourth Five-Year Review Report, Former Mather Air Force Base, Sacramento County, California**

Introduction

The California Department of Fish and Wildlife, Office of Spill Prevention and Response (CDFW-OSPR) appreciates the opportunity to review the subject documents as referenced above. CDFW-OSPR received an electronic link to download the Final Fourth Five-Year Review Report (5-YRR) from the Department of Toxic Substances Control (DTSC) on September 1, 2015. The Air Force's response to CDFW-OSPR's review memorandum dated June 2, 2015 (Tsao and Nakahara, 2015) was received as part of the Final 5-YRR. The comments that follow are provided as part of our role as a natural resource Trustee for the State of California's fish and wildlife, and their habitats. The CDFW is the State's Trustee for fish and wildlife resources pursuant to Fish and Game Code Section 711.7. The CDFW is also designated as a Trustee for natural resources pursuant to Comprehensive Environmental Response, Compensation, and Liability Act Section 107 (f)(2)(B).

Background

The former Mather Air Force Base (Mather) is approximately 5,800 acres in size and is located in Sacramento County. It is partially within the city limits of Rancho Cordova, located about 80 miles northeast of San Francisco and 10 miles east of Sacramento. The base closed in 1993. There are 89 Installation Restoration Program (IRP) sites at Mather. These 89 IRP sites were categorized into six Operable Units (OUs), based on similarities in contaminants, affected media, and/or timing of cleanup decisions. OU 1 (also called the Aircraft Control and Warning [AC&W] OU) consists of a contaminated groundwater plume and three sites where underground storage tanks (USTs) were removed. OU 2 (also called the Groundwater OU) consists of three additional contaminated groundwater plumes. OU 3 (also called the Soil OU) consists of contaminated soils associated with

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waste disposal pits, oil-water separators (OWSs), gas stations, USTs, fire training areas, and other sites where contaminated soil is present. OU 4 (also called the Landfill OU) consists of six sites where municipal waste was buried. OUs 5 and 6 (also called the Basewide OU and Supplemental Basewide OU, respectively) consist of the contaminated soil sites not included in other OUs. The habitats at the base, including grassland, lake, riparian, seasonal wetlands, and vernal pools are used by many wildlife species representing different trophic levels.

CDFW-OSPR previously commented on the revised Draft Final Record of Decision (ROD) and related documents in an August 13, 1998 memorandum to the DTSC (Chernoff, 1998). In that memorandum, CDFW-OSPR raised concerns about the appropriateness of the 700 mg/kg threshold criteria for lead removal in soil proposed by the Air Force. CDFW-OSPR also provided comments on the Draft Finding of Suitability for Transfer (Gray, 2005). Additionally, CDFW-OSPR provided comments on the Draft Small Mammal Work Plan (Gray and Stanton, 2006). CDFW-OSPR received responses to our comments (RTCs, Gray and Stanton, 2006) from Bill Hughes of ASE, Inc., the Air Force contractor on April 6, 2007. The response from the Air Force represent agreements reached between CDFW-OSPR and the Air Force on which tissues (i.e., liver and kidney tissue) and toxicity benchmark levels (1.1 - 2.1 mg/kg wet weight kidney lead concentration [Fowler et al. 1980]) to be used for evaluation. CDFW-OSPR also provided comments on the small mammal monitoring reports and results. The following is the list of monitoring reports previously reviewed by CDFW-OSPR (followed by the reference to our review memoranda):

- September 2008 Draft Results of Small Mammal Monitoring at Site 87 (Tsao, 2008);
- Air Force's Response to CDFW-OSPR Comments on September 2008 Draft Results of Small Mammal Monitoring at Site 87 (Tsao, 2009a);
- Draft Final Results of 2008 Small Mammal Monitoring at Site 87 (Tsao, 2009b);
- Draft, Draft Final, and Final Results of 2009 Small Mammal Monitoring at Site 87 (Tsao, 2010a, b, c).

On October 31, 2014, CDFW-OSPR provided comments on the Draft Fourth Five-Year Review Report (Tsao and Nakahara, 2014) and received the Air Force's RTCs as part of the Draft Final 5-YRR in May, 2015. CDFW-OSPR reviewed the RTCs and the Draft Final 5-YRR and provided comments in June, 2015 (Tsao and Nakahara, 2015). The Air Force released the RTCs to our June memorandum in September, 2015 as part of the Final 5-YRR report. CDFW-OSPR's comments and response to the Air Force's responses on the various versions of the 5-YRR are divided into three sections as follows:

- CDFW-OSPR comments on the Final 5-YRR,
- Reply to the second RTCs on the Draft 5-YRR, and
- Reply to the Draft Final 5-YRR.

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I. Comments on Final Fourth 5-Year Review

General Comments

1. The Air Force has not complied with the terms and conditions documented in the 1998 Basewide ROD, to be conducted as part of the remedial action for Site OT-87. CDFW-OSPR believes the Air Force has not complied with the 1998 Basewide ROD for the following reasons:
 - a. The ROD for Site OT-87 indicates that small mammal monitoring, including quantification of lead tissue concentrations for three years, is a requirement of the ROD and which the Air Force is required to complete as part of the remedial action. The Air Force was not able to capture any small mammals in 2007 and yet identified this as a monitoring year. CDFW-OSPR does not agree that 2007 counts as a monitoring year towards the completion of the remedial action, as no tissues or sample were obtained for lead concentration analysis. CDFW-OSPR has documented our disagreement in numerous memoranda (Tsao, 2008; 2009a; 2009b; 2010a; 2010b; and 2010c). The U.S. Environmental Protection Agency (US EPA) and DTSC, also believe that failure to capture any small mammals would not constitute a monitoring year. Thus, the subject document should note that the US EPA, DTSC, and CDFW-OSPR disagree that the Air Force has completed its obligation to monitor small mammals at Site 87. Because the monitoring of small mammals is a component of the Air Force's remedial action as indicated in the subject report, CDFW-OSPR does not consider the remedial action to be complete.
 - b. The ROD also mandates the Air Force to cooperatively develop a dead waterfowl monitoring program with the regulatory agencies to ensure that the residual levels of lead left in place at Site 87 do not represent a hazard to waterfowl. The ROD states, "*the monitoring program will be worked out cooperatively between the Air Force and the regulatory agencies.*" CDFW-OSPR reviewed the work plan for small mammals but we have not yet seen a work plan on how the Air Force will monitor the waterfowl. The Air Force has not developed and implemented the monitoring program for dead waterfowl in coordination with the regulatory agencies and therefore, has not met the requirements of the ROD for waterfowl monitoring. For this reason, CDFW-OSPR cannot consider the remedial action as complete.

Based on the reasons explained above, CDFW-OSPR recommends DTSC and the US EPA not accept any statement in the subject document that indicates small mammal monitoring (and by the extension, the remedial action) is complete (e.g., Table 1-1). Furthermore, CDFW-OSPR recommends DTSC and the US EPA not accept any statement in the subject that indicates remedy at Site OT-87 is protective of the environment (e.g., page SF-5, protectiveness statement). CDFW-OSPR strongly recommends the US EPA and DTSC insist on conducting a third year of small mammal monitoring to collect tissue samples for analysis. Furthermore, the Air Force is required to develop a monitoring program for waterfowl, cooperatively with the agencies. If the Air Force fails to do so, they would not be in compliance with the ROD.

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Specific Comments

1. *Page SF-4, Issues and Recommendations Identified in the Five-Year Review.* Site OT-87, previously included in the Draft Final document, has been removed from this section. Site OT-87 is still an issue of concern based on our comments in this memorandum as well as previous memoranda (Tsao and Nakahara, 2014 and 2015) and should still be included in this section. CDFW-OSPR requests the Air Force propagate Site OT-87 issues/recommendation identified in the Draft Final 5-YRR to the Final 5-YRR. Specifically, acknowledge the following:
 - *A potential issue concerning monitoring the exposure of small mammals to residual lead at Site OT-87. The Air Force believes the remedy to be protective; the regulatory agencies believe more data are needed to be able to determine protectiveness* (originally appeared under Operable Units with Issues on page ES-3).
 - *Although the Air Force believes the remedy for Site OT-87 to be protective for the environment, the regulatory agencies believe more data are needed to make that determination. The U. S. EPA will coordinate with the State of California to propose a path forward for resolving the disagreement* (originally appeared under Issues of Concern/Next Steps on page ES-11).
2. The comment above also applies the following sections: page ES-3 under Operable Units with Issues; pages ES-13 to ES-14, Issues of Concern/Next Steps; page 8-2, Section 8.0 Issues Identified During Five-Year Review, Recommendations, and Follow-up Actions; and page 8-3, Table 8-1 Issues Identified During This Five-Year Review, Recommendations, and Follow-up Actions.
3. *Page SF-5. Protective Determination.* CDFW-OSPR disagrees with the statement that the remedy for OT-87 is protective of the environment. The Air Force has yet to complete the third year of small mammal monitoring and has yet to develop a collaborative work plan with the agencies to monitor for dead waterfowl. Given the presence of significant residual lead shot, incomplete small mammal monitoring, absence of a dead waterfowl monitoring plan, and absence of a Remedial Action Objective (see Section III, Comment 1(a) below), we believe it is premature to state that the remedy for OT-87 is protective of the environment.

II. The following replies are in response to the second RTCs CDFW-OSPR received on the Draft Fourth 5-YRR, referenced according to their original comment numbers where applicable.

1. *Second Response to Specific Comment 5. Page 4-33, Section 4.4.5 Site OT-87, Subsection Remedy Implementation.* The Air Force is not in compliance with the requirement in the ROD for monitoring dead waterfowl which states, "*The details of the monitoring program will be worked out cooperatively between the Air Force and the regulatory agencies*" (AFBCA, 1998; see Attachment 1). The Air Force has not developed and implemented the monitoring program for dead waterfowl in coordination with the regulatory agencies and therefore, has not met the requirements of waterfowl

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monitoring documented in the ROD. Please see CDFW-OSPR's response to Specific Comment 5 on the Draft Fourth Five-Year Review dated June 2, 2015 (Tsao and Nakahara, 2015).

2. *Second Response to Specific Comments 7 and Recommendations 1 and 2.* The response is not acceptable, and only partially addresses CDFW-OSPR's comment. At the comment resolution meeting held on March 16, 2010, Dr. Norlach of MWH stated, "*Eisler does not have a specific effect level one can use.*" CDFW-OSPR believes this is why MWH concurred with CDFW-OSPR's recommendation (MWH, 2008) and included the agreed-upon benchmark from Fowler et al. (1980) in its draft 2008 small mammal monitoring report (MWH, 2009; Fortun, 2009). CDFW-OSPR assumes the toxicity benchmark that the Air Force alluded to is the Schlick et al. (1983) study (cited in Eisler [1998]) used in the 2009 Final Small Mammal Monitoring Report. According to the Air Force (MWH, 2010), the Schlick et al. (1983) study is based on liver tissue lead concentration associated with inhibition of mouse's δ -aminolevulinate dehydratase (ALAD) enzymatic activity in an *in vitro* liver homogenate system (MWH, 2010). The Air Force has already acknowledged such a study has questionable relevance to small mammal exposure (MWH, 2010). CDFW-OSPR cannot accept the Schlick et al. (1983) study be used for small mammal monitoring. CDFW-OSPR maintains the Lowest Observed Effects Level range (1.1 – 2.1) from Fowler et al. (1980) be used, or conduct its own toxicity study to develop a benchmark; CDFW-OSPR also provided a number of options in our 2014 memorandum to DTSC (Tsao and Nakahara, 2014).

III. The following replies are in response to the Air Force's RTCs on the Draft Final Fourth Five-Year Review referenced according to their original comment numbers where applicable.

1. *Response to Specific Comment 1. Page ES-9, Table ES-11, Operable Units Evaluated in this Five-Year Review.*
 - a. Specific Comment 1(a) questions the apparent lack of the Remedial Action Objective (RAO) for Site OT-87 under the 1998 Basewide ROD (AFBCA, 1998). In response, the Air Force acknowledged that the 1998 Basewide ROD **does not have** an RAO for Site OT-87. The Air Force offers the following statement as equivalent to the RAO: *The basis for cleanup is protection of human health, groundwater and surface water quality, and ecological receptors.* However, this statement does not appear to meet the specificity required by the US EPA (US EPA, 1999) because it does not specify the goal of the remedy and its end use (e.g., prevent ingestion or uptake of lead by ecological receptors at concentrations that could be harmful to them or to animals that consume them). Without the specificity of the RAO, it is not possible to determine if the RAO has been met by the remedy. CDFW-OSPR defers to DTSC and the US EPA on the adequacy of the Air Force proposed RAO for Site OT-87.
 - b. *Response to Specific Comment 1(b)(2).* CDFW-OSPR agrees with the Air Force that small mammal and waterfowl monitoring **are** both components of the

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remedy, but these components for monitoring small mammals and waterfowl has not yet been completed. See General Comment 1 and Specific Comments 1, 2, and 3 on the Final 5-YRR above.

- c. *Response to Specific Comment 1(c)(1).* The response is partially complete. The Air Force does not address the continual release of lead shot in the environment from weathering and degradation into the fine soil fraction, which can then be exposed to ecological receptors via food-chain uptake or direct contact by soil invertebrates.
 - d. *Response to Specific Comment 1(c)(2).* CDFW-OSPR disagrees with the Air Force's claim that OT-87 is no longer a concern. The Air Force has not completed its third year of small mammal monitoring and has not collaborated with the agencies to cooperatively work out a waterfowl monitoring program and lead may still pose a risk to ecological receptors and natural resources. Our response is the same for Specific Comments 2(a), 2(b), 3, 5, 7(b) and 9.
2. *Response to Specific Comment 2(a) and 2(b). Page ES-11, Section Issues of Concern/Next Steps.* CDFW-OSPR does not agree with the Air Force's response: "Site OT-87 has been deleted from this section because it is not deemed an issue of concern." CDFW-OSPR still believes Site OT-87 is an issue of concern and has documented our concerns in this memorandum as well as numerous previous memoranda (Tsao, 2008, 2009a, 2009b, 2010a, 2010b, 2010c, Tsao and Nakahara, 2014 and 2015); CDFW-OSPR's concerns for Site OT-87 should be carried forward from the Draft Final and included in this section.
 3. *Response to Specific Comment 4a. Page 2-10, Section 2.6.4 Site OT-87.* CDFW-OSPR reiterates our previous request that the text regarding the monitoring program for dead waterfowl, be revised. Please also see Second Response to Specific Comment 5 on the Draft Fourth Five-Year Review (which is Specific Comment 1 above).
 4. *Response to Specific Comment 5. Page 7-48, Section 7.6.4.1 Question A: Is the remedy functioning as intended by the decision documents?"* CDFW-OSPR reiterates our previous request to revise the text regarding the monitoring program for dead waterfowl. Please also see Second Response to Specific Comment 5 on the Draft Fourth Five-Year Review (Specific Comment 1 above).
 5. *Response to Specific Comment 6. Page 8-4, Table 8-1 Issues Identified During This Five-Year Review, Recommendations, and Follow-Up Actions.* The entries have been revised to use the same date format; however, Site OT-87 has been completely removed from the table. Site OT-87 is still an issue of concern based on comments in this memorandum and previous memoranda (Tsao and Nakahara, 2014 and 2015) and should still be included in Table 8-1.
 6. *Response to Specific Comment 7(c).* CDFW-OSPR disagrees that the statement provided in the Draft Final 5-YRR should no longer be in the document. CDFW-OSPR

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recommends that the statement "*regulatory agencies believe more data is needed to be able to determine protectiveness*" is still applicable and should still remain throughout the entire document when the protectiveness of the remedy is discussed on Site OT-87.

7. *Response to Specific Comment 8(a)*. CDFW-OSPR cannot agree with the Air Force response without knowing the spatial scale the Air Force intends to use. Without this information CDFW-OSPR is unable to evaluate the Air Force response in the proper context.
8. *Response to Specific Comment 8(b)*. It is unclear what adjustment factor (or equation) the Air Force used to convert the XRF reading to an estimated soil concentration. It also appears that the three soil concentrations from the 3 sampling locations identified by CDFW-OSPR (Tsao and Nakahara, 2015) were not used in the re-calculation of the 95 Upper Confidence Limit (UCL) on the mean. Also, to be clear, as CDFW-OSPR has stated previously, the 95 UCL has no relevance because the hotspot concentration for lead in soil has not been spatially bounded in many areas and as a result, the 95 UCL remains biased low.
9. *Response to Specific Comment 8(d)*. The response does not address the comment.

Conclusion

CDFW-OSPR strongly recommends the Air Force to complete a third year of small mammal monitoring and develop a waterfowl monitoring program in coordination with CDFW-OSPR. Additionally, given that there is no RAO for Site OT-87 in the 1998 ROD, the Air Force proposed RAO in the Final 5-YRR does not appear to meet the standard of the US EPA and DTSC.

Residual lead shot serves as a source of lead that continues to contaminant the environment. Leaving the source behind does not appear to meet the standard of the US EPA (US EPA, 1997). CDFW-OSPR maintains our on-going recommendation to conduct additional evaluation to determine if the residual lead shot left in various areas at Site OT-87 is at levels protective of the environment.

We appreciate the opportunity to comment on the report. If you have any questions regarding this review or require further details, please contact Allen Tsao regarding contaminants at (916) 323-4731 or by email at Allen.Tsao@wildlife.ca.gov or contact Tami Nakahara regarding biological issues at (916) 324-8452 or by email at Tami.Nakahara@wildlife.ca.gov.

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 Charlie Huang, PhD., Staff Toxicologist

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Attachment 1
Excerpts from Chapter 2 of the Final Record of
Decision, Basewide Operable Units, August 1998.

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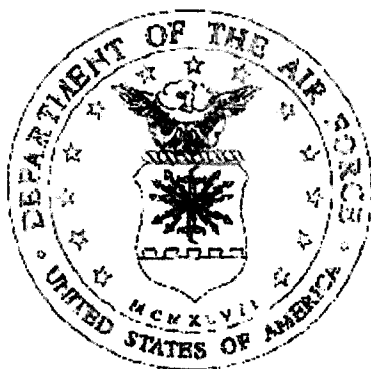
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**AIR FORCE
INSTALLATION RESTORATION PROGRAM**

FINAL COMPREHENSIVE ENVIRONMENTAL
RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980
RECORD OF DECISION

BASEWIDE OPERABLE UNIT SITES

MATHER AIR FORCE BASE, CALIFORNIA



AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE

BROOKS AIR FORCE BASE, TEXAS

AUGUST 24, 1998

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Development of ecological cleanup goals for terrestrial sites at Mather AFB incorporated information on special status species within the area and data from the Phase II investigation. No special status or protected species are associated with Site 87. Because the Phase II investigation at Site 20 did not indicate ecological risks to terrestrial receptors when compared to a reference site, the 95 percent upper confidence limit of the mean concentration of lead in surface soil at Site 20 (700 mg/kg) was used as an ecological cleanup goal for lead in Mather AFB surface soils. As a final note, surface soil lead concentrations for Site 20 (Phase II investigation) ranged from 151 to 703 mg/kg with a 95 percent upper confidence limit of the mean concentration of 700 mg/kg. Site 87 had a 95 percent upper confidence limit of the mean concentration of 718 mg/kg for lead. This indicates that lead exposure concentrations at the two sites are similar on a site-wide basis.

The Air Force will perform monitoring to insure that the residual levels of lead left in place at Site 87 do not represent a hazard to small mammals and waterfowl. To accomplish this, monitoring of lead levels in small mammal tissue will be required on an annual basis for three years, with the results evaluated in an annual monitoring report to the regulatory agencies. In addition, any dead waterfowl found in the area of Site 87 must be reported to the regulatory agencies, and necropsied by a certified laboratory for signs of lead toxicity. The details of the monitoring program will be worked out cooperatively between the Air Force and the regulatory agencies.

If small mammal tissue lead levels are lower than those reported to cause adverse effects [Eisler 1998] after a minimum of two years of monitoring, then monitoring will be discontinued upon agreement by the regulatory agencies. If small mammal tissue lead levels are higher than those reported to cause adverse effects [Eisler 1998] after a minimum of two years of monitoring, then further ecological investigation and re-evaluation of the lead cleanup level will be conducted. The Air Force may have to undertake additional remedial action to reduce lead levels at Site 87.

If necropsied waterfowl show evidence of adverse effects due to ingestion of lead, then further ecological investigation and re-evaluation of the lead cleanup level will be conducted. The Air Force may have to undertake additional remedial action to reduce lead levels at Site 87.

2.2.10 Remedial Action Operation and Maintenance

The CERCLA program at Mather AFB has identified 88 sites organized into six operable units. As of this ROID, 83 of those sites have been selected either for remedial action or no further

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